

REPORT OF
ANALYTICAL EVALUATION PROGRAM
STANDARD REFERENCE WATER SAMPLES NUMBERS 41 AND 42

U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
Lakewood, Colorado
March 1973

STANDARD REFERENCE WATER SAMPLES NUMBERS 41 AND 42

PURPOSE AND PLAN

As a means of providing an independent and objective evaluation of the water-quality data published by the U.S. Geological Survey and other cooperating laboratories, standard reference water samples are prepared and distributed at regular intervals. This report summarizes the analytical results submitted by 27 laboratories for Standard Reference Water Samples numbers 41 and 42 distributed on March 9, 1973. The samples were packed in ice and shipped in insulated containers.

The "Instructions for Analysis and Reporting Results" specified only that pH and/or alkalinity determinations be performed first if these determinations are requested. No other required order of performing the determinations, nor restrictions on methods and equipment were given. Additional instructions were provided for samples 41 and 42. When the samples arrived, they were to be stored immediately at 1°C and analyzed within 3 days. To evaluate the efficiency of the shipping containers and arrival conditions for these samples, each laboratory was requested to provide the following: the date and time that the samples were received and the temperature of the ice-water mixture surrounding the bottles.

This program operates as a quality-control tool to enable each laboratory to detect deficiencies. Participating laboratories are identified in this report only by a pre-assigned code number.

PREPARATION OF SAMPLES

Approximately 50 gallons of each sample was collected. Sample No. 41 was collected on February 5, 1973. The sample was filtered through a 0.45- μ m membrane filter on February 6, 1973, and adenosine-5'-monophosphate and potassium nitrate added on February 7, 1973. The sample was then mixed for two hours with a motor-driven stirrer, pumped through an ultraviolet (2537A) sterilizer and packaged in sterile teflon bottles under ultraviolet radiation, and stored at 1°C. Sample No. 42 was collected on February 7, 1973 and treated in the same manner.

DETERMINATIONS

Organic nitrogen (N)	Nitrate-nitrogen (N)
Nitrite-nitrogen (N)	Orthophosphate-phosphorus (P)
Ammonia-nitrogen (N)	Phosphorus, total (P)

PARTICIPATING LABORATORIES

U.S. Geological Survey

ALABAMA, Tuscaloosa	PENNSYLVANIA, Harrisburg
ARKANSAS, Little Rock	PUERTO RICO, San Juan
DISTRICT COLUMBIA, Washington	TEXAS, Austin
FLORIDA, Ocala	TEXAS, Houston
FLORIDA, Tampa	UTAH, Salt Lake City
LOUISIANA, Baton Rouge	VIRGINIA, Charlottesville
NEW YORK, Albany	WASHINGTON, Tacoma
OKLAHOMA, Oklahoma City	

Other

ALABAMA, University: State Geological Survey
ARKANSAS, Little Rock: State Dept. of Pollution Control & Ecol.
DELAWARE, Newark: State Geological Survey
GEORGIA, Atlanta: State Water-Quality Control Board
KANSAS, Topeka: State Department of Health
MISSOURI, Rolla: State Geological Survey
MISSOURI, St. Louis: City Sewer District
MONTANA, Butte: State Bureau of Mines and Geology
NORTH DAKOTA, Bismarck: State Water Conservation Commission
SOUTH CAROLINA, Columbia: State Pollution Control Authority
TENNESSEE, Chattanooga: Tennessee Valley Authority
WISCONSIN, Delafield: State Department of Natural Resources

STATISTICAL EVALUATION

A statistical analysis of the data has established the most reliable estimate of the true value for each of the various determinations reported. Mathematical calculations are the same as those used previously.

The mean, average deviation, percent deviation from the mean, standard deviation, and total range were calculated for each determination. Confidence limits about the mean were also calculated in order to define the concentration range within which the true value may be expected to fall with a confidence level of 95 percent. Outlying values were rejected on the basis of statistical tests as outlined in ASTM Recommended Practice for Dealing with Outlying Observations (1969 Book of ASTM Standards, Part 30, p. 429-445).

REPORTED VALUES

The following section shows the reported value for each determination by each participating laboratory, and a graphical presentation of each reported value and the frequency of its occurrence. Each reported value has been rounded off, when necessary, to conform to official USGS policy on reporting analytical data. A few extreme values are not shown on the scale.

A summary shows the number of laboratories reporting values for each determination and the percentage of values rejected. The percentages of unrejected values falling within the 95-percent confidence interval, within one standard deviation ($\bar{X} \pm \text{STD}$), and within two standard deviations ($\bar{X} \pm 2 \text{ STD}$) are also given.

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
3-73	1	1.6	38.3	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	2	1.2	3.7	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	3	0.84	27.4	OTHER
3-73	4	1.2	3.7	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	5	1.2	3.7	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	6	0.25	78.4	KJELDAHL, APHA STD METH, 13ED, 1971
3-73	7	0.65	43.8	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	8	0.99	14.4	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	9	1.3	12.4	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	10	0.42	63.7	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	12	0.26	77.5	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	13	1.4	21.0	KJELDAHL-MANUAL--: TECHNICON AUTOANALYZER, INDOPHENOL
3-73	14	0.08	93.1	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	15	2.6	124.8	TECHNICON AUTOANALYZER
3-73	16	1.6	38.3	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	17			NOT DETERMINED
3-73	19			NOT DETERMINED
3-73	21	1.3	12.4	KJELDAHL-MANUAL--: TECHNICON AUTOANALYZER, INDOPHENOL
3-73	22	6.6	470.6	REJECT OTHER
3-73	23	1.7	47.0	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	24	1.7	47.0	TECHNICON AUTOANALYZER
3-73	25	1.4	21.0	TECHNICON AUTOANALYZER
3-73	26	1.3	12.4	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	27			NOT DETERMINED
3-73	28			NOT DETERMINED
3-73	29			NOT DETERMINED
3-73	30	1.3	12.4	KJELDAHL, USGS TWRI, BK5 CH A1

TOTAL RANGE 0.08 - 6.6
 MEAN 1.1567
 STANDARD DEVIATION 0.5910
 AVERAGE DEVIATION 0.4387
 95 PCT.CONF.INTVL OF MEAN 1.1567 +OR- 0.2690
 SAMPLE 41

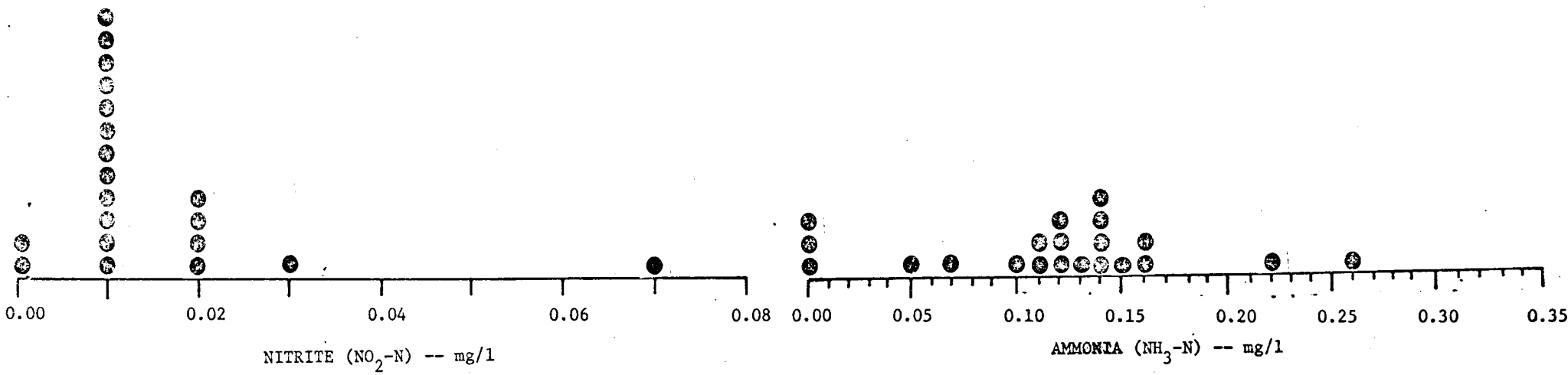
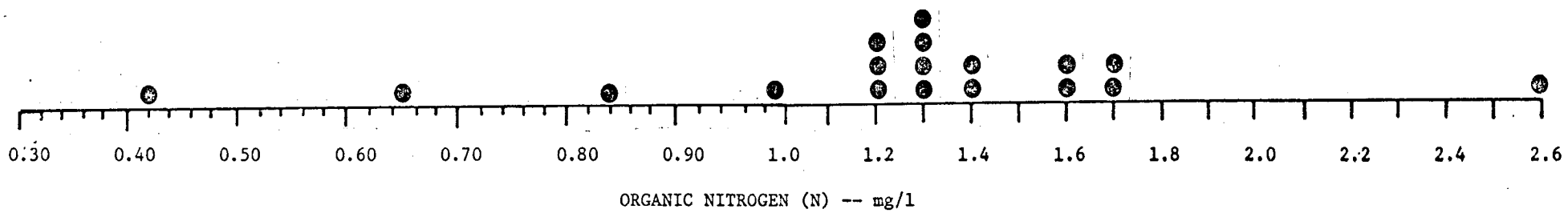
15 1.003 ± .536

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
3-73	1	0.01	17.4	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	2	0.02	65.2	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	3			NOT DETERMINED
3-73	4	0.01	17.4	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	5	0.01	17.4	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	6	0.02	65.2	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	7	0.01	17.4	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	8	0.01	17.4	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	9			NOT DETERMINED
3-73	10	0.01	17.4	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	12	0.01	17.4	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	13	0.02	65.2	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	14			NOT DETERMINED
3-73	15	0.01	17.4	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	16	0.01	17.4	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	17			NOT DETERMINED
3-73	19			NOT DETERMINED
3-73	21	0.0	100.0	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	22	0.0	100.0	DIAZOTIZATION, 1972 ASTM PT23 D1254-67
3-73	23	0.01	17.4	DIAZOTIZATION, APHA STD METH, 13ED, 1971
3-73	24	0.07	478.3	REJECT TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	25	0.01	17.4	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	26	0.02	65.2	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	27			NOT DETERMINED
3-73	28			NOT DETERMINED
3-73	29	0.03	147.9	DIAZOTIZATION, 1972 ASTM PT23 D1254-67
3-73	30	0.01	17.4	DIAZOTIZATION, USGS TWRI, BK5 CH A1

TOTAL RANGE	0.0	-	0.07				SAMPLE 41
MEAN		0.0121	AVERAGE DEVIATION	0.0052			
STANDARD DEVIATION		0.0071	95 PCT.CONF.INTVL OF MEAN	0.0121 +OR-	0.0034		N02-N

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
3-73	1			NOT DETERMINED
3-73	2	0.13	11.9	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	3	0.22	89.3	OTHER
3-73	4	0.11	5.3	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	5	0.11	5.3	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	6	0.0	100.0	DISTILLATION-TITRATION, USGS TWRI, BK5 CH A1
3-73	7	0.12	3.3	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	8	0.12	3.3	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	9	0.14	20.5	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	10	0.07	39.8	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	12	0.14	20.5	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	13	0.16	37.7	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	14			NOT DETERMINED
3-73	15	0.15	29.1	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	16	0.16	37.7	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	17			NOT DETERMINED
3-73	19			NOT DETERMINED
3-73	21	0.10	13.9	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	22	0.0	100.0	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	23	0.26	123.8	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	24	0.14	20.5	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	25	0.12	3.3	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	26	0.14	20.5	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	27			NOT DETERMINED
3-73	28			NOT DETERMINED
3-73	29	0.0	100.0	DISTILLATION-TITRATION, APHA STD METH, 13ED, 1971
3-73	30	0.05	57.0	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1

TOTAL RANGE	0.0	-	0.26				SAMPLE 41
MEAN	0.1162		AVERAGE DEVIATION	0.0466			
STANDARD DEVIATION	0.0657		95 PCT.CONF.INTVL OF MEAN	0.1162 +OR-	0.0299		NH3-N



SAMPLE NO. 41

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
3-73	1	.01 1.1 1	14.6	BRUCINE, USGS TWRI, BK5 CH A1
3-73	2	.02 1.0 1	4.2	BRUCINE, USGS TWRI, BK5 CH A1
3-73	3	— 0.8 2	16.7	PHENOLDISULFONIC ACID, APHA STD METH, 13ED, 1971
3-73	4	.01 1.1 6	14.6	1.11 TECHNICON AUTOANALYZER, CADMIUM REDUCTION
3-73	5	.01 1.0 6	4.2	1.01 TECHNICON AUTOANALYZER, CADMIUM REDUCTION
3-73	6	.02 0.4 1	58.3	REJECT BRUCINE, USGS TWRI, BK5 CH A1
3-73	7	.01 1.0 5	4.2	1.01 TECHNICON AUTOANALYZER, HYDRAZINE REDUCTION
3-73	8	.01 1.0 1	4.2	BRUCINE, USGS TWRI, BK5 CH A1
3-73	9	— 1.0 1	4.2	BRUCINE, USGS TWRI, BK5 CH A1
3-73	10	.01 1.0 1	4.2	BRUCINE, USGS TWRI, BK5 CH A1
3-73	12	.01 1.1 1	14.6	BRUCINE, USGS TWRI, BK5 CH A1
3-73	13	.02 1.0 6	4.2	1.02 TECHNICON AUTOANALYZER, CADMIUM REDUCTION
3-73	14	— 1.0 1	4.2	BRUCINE, USGS TWRI, BK5 CH A1
3-73	15	.01 1.0 5	4.2	1.01 TECHNICON AUTOANALYZER, HYDRAZINE REDUCTION
3-73	16	.01 16.0 1	*****	REJECT BRUCINE, USGS TWRI, BK5 CH A1
3-73	17	— 0.7 1	27.1	BRUCINE, APHA STD METH, 13ED, 1971
3-73	19	— 1.2 20	25.0	OTHER
3-73	21	.0 1.0 20	4.2	OTHER
3-73	22	.0 0.8 2	16.7	PHENOLDISULFONIC ACID, APHA STD METH, 13ED, 1971
3-73	23	.01 0.6 2	37.5	PHENOLDISULFONIC ACID, APHA STD METH, 13ED, 1971
3-73	24	.07 1.0 6	4.2	1.07 TECHNICON AUTOANALYZER, CADMIUM REDUCTION
3-73	25	.01 1.2 5	25.0	1.21 TECHNICON AUTOANALYZER, HYDRAZINE REDUCTION
3-73	26	.02 0.9 1	6.2	BRUCINE, USGS TWRI, BK5 CH A1
3-73	27	— 1.0 3	4.2	BRUCINE, APHA STD METH, 13ED, 1971
3-73	28	— 0.8 2	16.7	PHENOLDISULFONIC ACID, APHA STD METH, 13ED, 1971
3-73	29	.03 0.8 3	16.7	BRUCINE, APHA STD METH, 13ED, 1971
3-73	30	.01 0.9 2	6.2	PHENOLDISULFONIC ACID, APHA STD METH, 13ED, 1971

18

1.052 ± .046 4
1.01 ± 0.0 2
1.0 ± 0.0 2

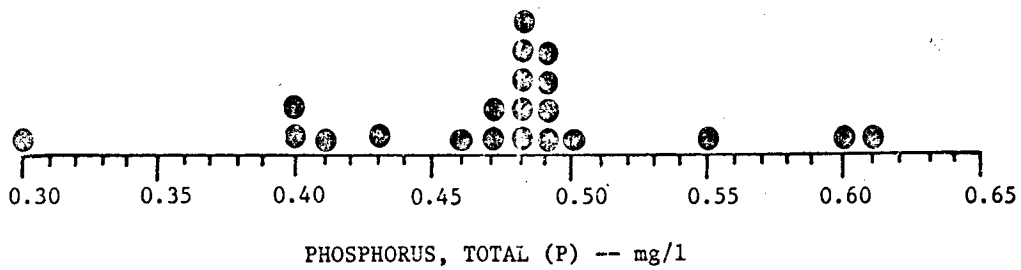
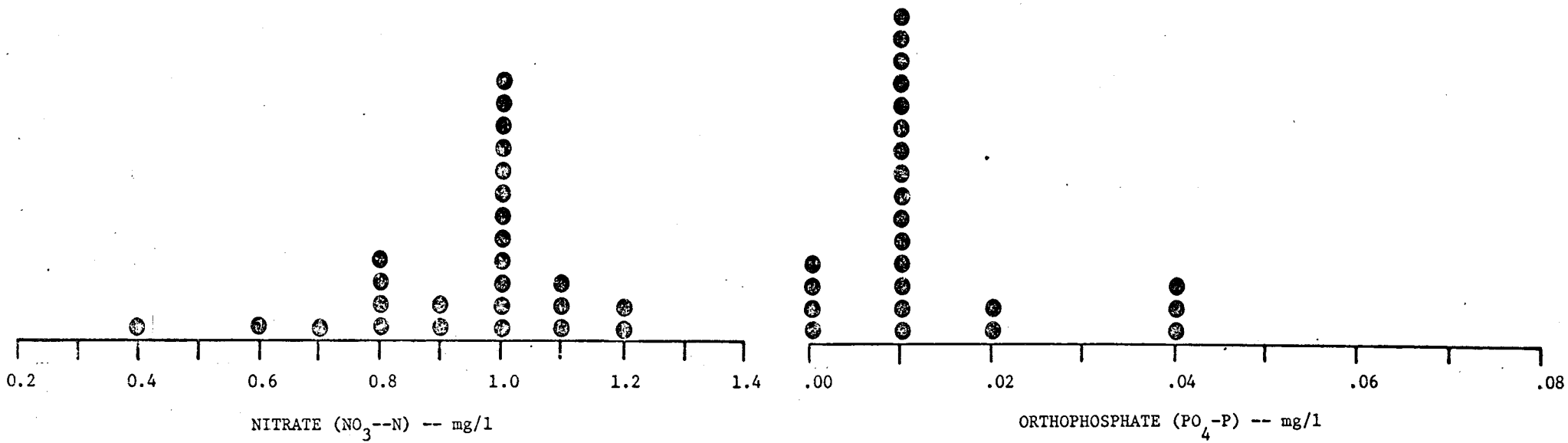
TOTAL RANGE	0.4	-	16				SAMPLE 41
MEAN	0.9600			AVERAGE DEVIATION	0.1104		
STANDARD DEVIATION	0.1443			95 PCT.CONF.INTVL OF MEAN	0.9600 +OR-	0.0596	NO3-N

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
3-73	1	0.01	22.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	2	0.01	22.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	3	0.01	22.6	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	4	0.04	209.7	OTHER
3-73	5	0.01	22.6	OTHER
3-73	6	0.01	22.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	7	0.01	22.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	8	0.01	22.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	9	0.01	22.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	10	0.0	100.0	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	12	0.0	100.0	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	13	0.01	22.6	TECHNICON AUTOANALYZER, ASCORBIC ACID
3-73	14	0.01	22.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	15	0.01	22.6	TECHNICON AUTOANALYZER, STANNOUS CHLORIDE
3-73	16	0.01	22.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	17			NOT DETERMINED
3-73	19			NOT DETERMINED
3-73	21	0.0	100.0	TECHNICON AUTOANALYZER, ASCORBIC ACID
3-73	22	0.01	22.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	23	0.01	22.6	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	24	0.04	209.7	TECHNICON AUTOANALYZER, ASCORBIC ACID
3-73	25	0.02	54.8	TECHNICON AUTOANALYZER, STANNOUS CHLORIDE
3-73	26	0.02	54.8	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	27	0.01	22.6	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	28			NOT DETERMINED
3-73	29	0.04	209.7	OTHER
3-73	30	0.0	100.0	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1

TOTAL RANGE	0.0	-	0.04					SAMPLE 41
MEAN		0.0129		AVERAGE DEVIATION		0.0080		
STANDARD DEVIATION		0.0116		95 PCT.CONF.INTVL OF MEAN		0.0129 +OR-	0.0049	PO4-P

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
3-73	1	0.49	5.3	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	2	0.48	3.1	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	3	0.46	1.2	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	4	0.61	31.1	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	5	0.41	11.9	OTHER
3-73	6	0.40	14.1	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	7	0.48	3.1	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	8	0.43	7.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	9	0.48	3.1	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	10	0.47	1.0	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	12	0.47	1.0	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	13	0.49	5.3	TECHNICON AUTOANALYZER, ASCORBIC ACID
3-73	14	0.49	5.3	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	15	0.50	7.4	TECHNICON AUTOANALYZER, STANNOUS CHLORIDE
3-73	16	0.28	39.8	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	17	0.49	5.3	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	19	0.48	3.1	OTHER
3-73	21	0.48	3.1	TECHNICON AUTOANALYZER, ASCORBIC ACID
3-73	22	0.04	91.4	REJECT PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	23	0.03	93.6	REJECT STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	24	0.60	28.9	OTHER
3-73	25	0.55	18.2	TECHNICON AUTOANALYZER, ASCORBIC ACID
3-73	26	0.40	14.1	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	27			NOT DETERMINED
3-73	28			NOT DETERMINED
3-73	29			NOT DETERMINED
3-73	30	0.30	35.5	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1

TOTAL RANGE	0.03	-	0.61					SAMPLE 41
MEAN	0.4655		AVERAGE DEVIATION	0.0526				
STANDARD DEVIATION	0.0773		95 PCT.CONF.INTVL OF MEAN	0.4655 +OR-	0.0343	P,TOTAL		



SAMPLE NO. 41

DETERMINATION	NO. LABS REPORTING	PCT. OF VALUES REJECTED	PCT. OF UNREJECTED VALUES WITHIN		
			95 PCT. CI	X +OR- STD	X +OR- 2STD
KJEL-N	22	5	48	76	95
NO2-N	20	5	63	63	95
NH3-N	21	0	52	71	95
NO3-N	27	7	48	68	96
PO4-P	24	0	63	71	88
P _T TOTAL	24	8	55	77	91

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
3-73	1	0.73	9.7	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	2	0.64	3.8	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	3	0.32	51.9	OTHER
3-73	4	0.96	44.3	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	5	0.67	0.7	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	6	1.3	95.3	KJELDAHL, APHA STD METH, 13ED, 1971
3-73	7	1.1	65.3	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	8	0.14	79.0	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	9	1.1	65.3	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	10	0.30	54.9	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	12	0.11	83.5	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	13	0.61	8.3	KJELDAHL-MANUAL--: TECHNICON AUTOANALYZER, INDOPHENOL
3-73	14	0.12	82.0	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	15	0.89	33.7	TECHNICON AUTOANALYZER
3-73	16	0.84	26.2	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	17			NOT DETERMINED
3-73	19			NOT DETERMINED
3-73	21	0.55	17.4	KJELDAHL-MANUAL--: TECHNICON AUTOANALYZER, INDOPHENOL
3-73	22	5.4	711.4	REJECT OTHER
3-73	23	0.95	42.7	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	24	0.70	5.2	TECHNICON AUTOANALYZER
3-73	25	0.63	5.3	TECHNICON AUTOANALYZER
3-73	26	0.65	2.3	KJELDAHL, USGS TWRI, BK5 CH A1
3-73	27			NOT DETERMINED
3-73	28			NOT DETERMINED
3-73	29			NOT DETERMINED
3-73	30			REJECT
		32	0.05	*****

TOTAL RANGE 0.11 - 32
 MEAN 0.6655
 STANDARD DEVIATION 0.3393

AVERAGE DEVIATION 0.2585
 95 PCT.CONF.INTVL OF MEAN 0.6655 +OR- 0.1588

SAMPLE 42 KJEL-N

14 0.686 ± 0.392

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
3-73	1	0.01	11.8	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	2	0.02	123.5	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	3			NOT DETERMINED
3-73	4	0.01	11.8	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	5	0.01	11.8	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	6	0.01	11.8	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	7	0.01	11.8	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	8	0.01	11.8	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	9			NOT DETERMINED
3-73	10	0.01	11.8	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	12	0.01	11.8	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	13	0.01	11.8	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	14			NOT DETERMINED
3-73	15	0.01	11.8	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	16	0.0	100.0	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	17			NOT DETERMINED
3-73	19			NOT DETERMINED
3-73	21	0.0	100.0	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	22	0.0	100.0	DIAZOTIZATION, 1972 ASTM PT23 D1254-67
3-73	23	0.01	11.8	DIAZOTIZATION, APHA STD METH, 13ED, 1971
3-73	24	0.10	*****	REJECT TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	25	0.01	11.8	TECHNICON AUTOANALYZER, DIAZOTIZATION
3-73	26	0.01	11.8	DIAZOTIZATION, USGS TWRI, BK5 CH A1
3-73	27			NOT DETERMINED
3-73	28			NOT DETERMINED
3-73	29	0.02	123.5	DIAZOTIZATION, 1972 ASTM PT23 D1254-67
3-73	30	0.0	100.0	DIAZOTIZATION, USGS TWRI, BK5 CH A1

TOTAL RANGE	0.0	-	0.10				SAMPLE 42
MEAN	0.0089		AVERAGE DEVIATION	0.0038			
STANDARD DEVIATION	0.0057		95 PCT.CONF.INTVL OF MEAN	0.0089 +OR-	0.0027		NO2-N

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
3-73	1			NOT DETERMINED
3-73	2	0.07	41.4	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	3	0.28	134.3	OTHER
3-73	4	0.11	8.0	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	5	0.12	0.4	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	6	0.0	100.0	DISTILLATION-TITRATION, USGS TWRI, BK5 CH A1
3-73	7	0.14	17.1	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	8	0.11	8.0	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	9	0.16	33.9	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	10	0.12	0.4	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	12	0.16	33.9	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	13	0.16	33.9	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	14			NOT DETERMINED
3-73	15	0.15	25.5	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	16	0.12	0.4	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	17			NOT DETERMINED
3-73	19			NOT DETERMINED
3-73	21	0.10	16.3	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	22	0.0	100.0	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	23	0.26	117.5	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	24	0.18	50.6	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	25	0.13	8.8	TECHNICON AUTOANALYZER, INDOPHENOL
3-73	26	0.09	24.7	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1
3-73	27			NOT DETERMINED
3-73	28			NOT DETERMINED
3-73	29	0.0	100.0	DISTILLATION-TITRATION, APHA STD METH, 13ED, 1971
3-73	30	0.05	58.2	DISTILLATION-NESSLERIZATION,USGS TWRI, BK5 CH A1

TOTAL RANGE	0.0	-	0.28				SAMPLE 42
MEAN	0.1195		AVERAGE DEVIATION	0.0520			
STANDARD DEVIATION	0.0732		95 PCT.CONF.INTVL OF MEAN	0.1195 +OR-	0.0333		NH3-N

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN		METHOD
3-73	1	2.1	11.2		BRUCINE, USGS TWRI, BK5 CH A1
3-73	2	1.9	0.6		BRUCINE, USGS TWRI, BK5 CH A1
3-73	3	1.6	15.3		PHENOLDISULFONIC ACID, APHA STD METH, 13ED, 1971
3-73	4	2.1	11.2		TECHNICON AUTOANALYZER, CADMIUM REDUCTION
3-73	5	2.0	5.9		TECHNICON AUTOANALYZER, CADMIUM REDUCTION
3-73	6	3.9	52.3	REJECT	BRUCINE, USGS TWRI, BK5 CH A1
3-73	7	1.9	0.6		TECHNICON AUTOANALYZER, HYDRAZINE REDUCTION
3-73	8	1.9	0.6		BRUCINE, USGS TWRI, BK5 CH A1
3-73	9	2.1	11.2		BRUCINE, USGS TWRI, BK5 CH A1
3-73	10	2.0	5.9		BRUCINE, USGS TWRI, BK5 CH A1
3-73	12	2.1	11.2		BRUCINE, USGS TWRI, BK5 CH A1
3-73	13	2.1	11.2		TECHNICON AUTOANALYZER, CADMIUM REDUCTION
3-73	14	1.6	15.3		BRUCINE, USGS TWRI, BK5 CH A1
3-73	15	2.0	5.9		TECHNICON AUTOANALYZER, HYDRAZINE REDUCTION
3-73	16	32	*****	REJECT	BRUCINE, USGS TWRI, BK5 CH A1
3-73	17	1.4	25.2		BRUCINE, APHA STD METH, 13ED, 1971
3-73	19	1.9	0.6		OTHER
3-73	21	2.0	5.9		OTHER
3-73	22	2.0	5.9		PHENOLDISULFONIC ACID, APHA STD METH, 13ED, 1971
3-73	23	1.2	36.4		PHENOLDISULFONIC ACID, APHA STD METH, 13ED, 1971
3-73	24	2.0	5.9		TECHNICON AUTOANALYZER, CADMIUM REDUCTION
3-73	25	2.3	21.8		TECHNICON AUTOANALYZER, HYDRAZINE REDUCTION
3-73	26	1.6	15.3		BRUCINE, USGS TWRI, BK5 CH A1
3-73	27	2.1	11.2		BRUCINE, APHA STD METH, 13ED, 1971
3-73	28	1.8	4.7		PHENOLDISULFONIC ACID, APHA STD METH, 13ED, 1971
3-73	29	1.8	4.7		BRUCINE, APHA STD METH, 13ED, 1971
3-73	30	1.7	10.0		PHENOLDISULFONIC ACID, APHA STD METH, 13ED, 1971

TOTAL RANGE	0.9	-	32				SAMPLE 42
MEAN		1.8880		AVERAGE DEVIATION	0.1923		
STANDARD DEVIATION		0.2522		95 PCT.CONF.INTVL OF MEAN	1.8880 +OR-	0.1841	NO3-N

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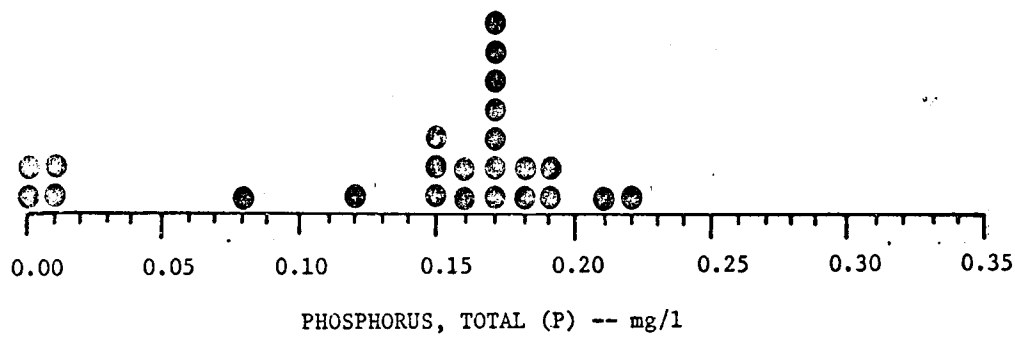
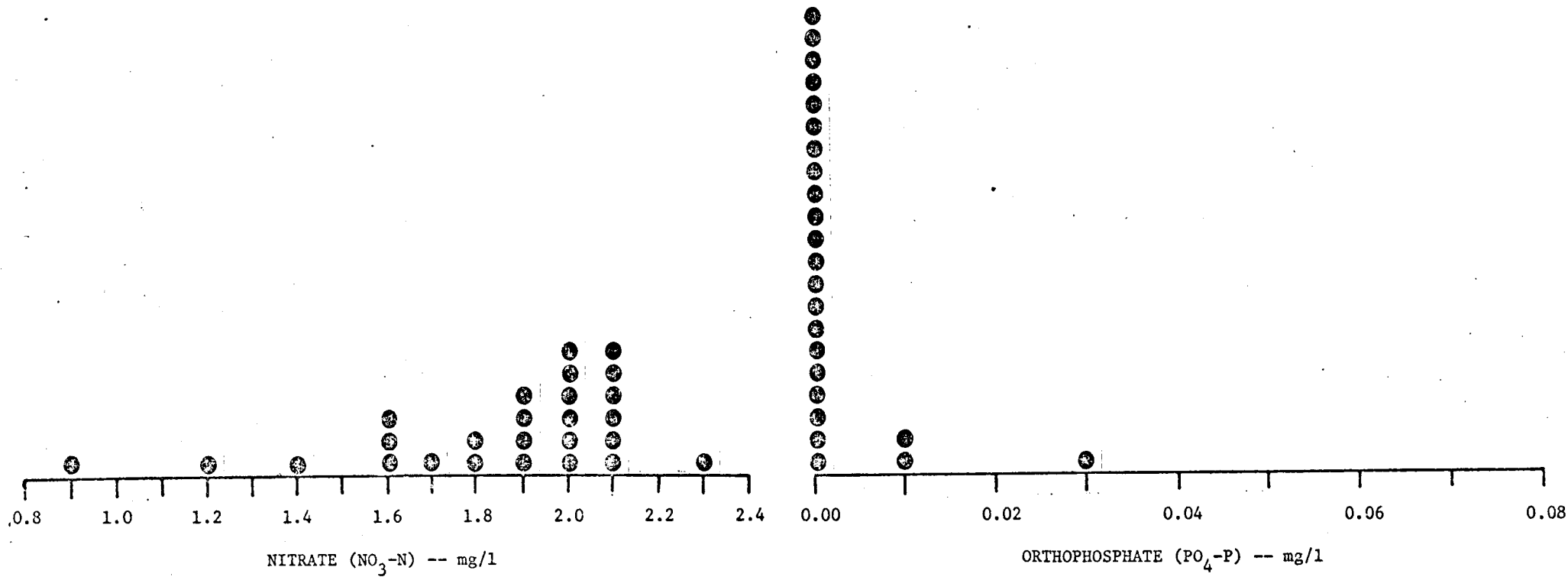
Date MO-YR	CODE	REPORTED VALUE		METHOD
3-73	1	0.00	1	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	2	0.00	1	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	3	0.00	2	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	4	0.03	20	OTHER
3-73	5	0.00	20	OTHER
3-73	6	0.00	1	PHOSPHOMOLYBDATE, USGS TWRI, BK5, CH A1
3-73	7	0.00	1	PHOSPHOMOLYBDATE, USGS TWRI, BK5, CH A1
3-73	8	0.00	1	PHOSPHOMOLYBDATE, USGS TWRI, BK5, CH A1
3-73	9	0.00	1	PHOSPHOMOLYBDATE, USGS TWRI, BK5, CH A1
3-73	10	0.00	1	PHOSPHOMOLYBDATE, USGS TWRI, BK5, CH A1
3-73	12	0.00	1	PHOSPHOMOLYBDATE, USGS TWRI, BK5, CH A1
3-73	13	0.01	3	REJECT TECHNICON AUTOANALYZER, ASCORBIC ACID
3-73	14	0.00	1	PHOSPHOMOLYBDATE, USGS TWRI, BK 5, CH A1
3-73	15	0.00	4	TECHNICON AUTOANALYZER, STANNOUS CHLORIDE
3-73	16	0.00	1	PHOSPHOMOLYBDATE, USGS TWRI, BK5, CH A1
3-73	17			NOT DETERMINED
3-73	19			NOT DETERMINED
3-73	21	0.00	3	TECHNICON AUTOANALYZER, ASCORBIC ACID
3-73	22	0.01	1	REJECT PHOSPHOMOLYBDATE, USGS TWRI, BK5, CH A1
3-73	23	0.00	2	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	24	0.00	3	TECHNICON AUTOANALYZER, ASCORBIC ACID
3-73	25	0.00	4	TECHNICON AUTOANALYZER, STANNOUS CHLORIDE
3-73	26	0.00	2	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	27	0.00	2	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	28			NOT DETERMINED
3-73	29	0.00	20	OTHER
3-73	30	0.00	1	PHOSPHOMOLYBDATE, USGS TWRI, BK5, CH A1

TOTAL RANGE 0.0 - 0.03
 MEAN 0.00

SAMPLE 42
 PO₄-P

DATE MO-YR	CODE	REPORTED VALUE	PCT.DEV. FROM MEAN	METHOD
3-73	1	0.16	14.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	2	0.18	29.0	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	3	0.19	36.1	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	4	0.22	57.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	5	0.12	14.0	OTHER
3-73	6	0.17	21.8	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	7	0.17	21.8	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	8	0.15	7.5	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	9	0.17	21.8	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	10	0.16	14.6	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	12	0.15	7.5	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	13	0.17	21.8	TECHNICON AUTOANALYZER, ASCORBIC ACID
3-73	14	0.17	21.8	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	15	0.17	21.8	TECHNICON AUTOANALYZER, STANNOUS CHLORIDE
3-73	16	0.01	92.8	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	17	0.19	29.0	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	19	0.19	36.1	OTHER
3-73	21	0.17	21.8	TECHNICON AUTOANALYZER, ASCORBIC ACID
3-73	22	0.0	100.0	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1
3-73	23	0.01	92.8	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	24	0.0	100.0	OTHER
3-73	25	0.21	50.4	TECHNICON AUTOANALYZER, ASCORBIC ACID
3-73	26	0.15	7.5	STANNOUS CHLORIDE, APHA STD METH, 13ED, 1971
3-73	27			NOT DETERMINED
3-73	28			NOT DETERMINED
3-73	29			NOT DETERMINED
3-73	30	0.08	42.7	PHOSPHOMOLYBDATE, USGS TWRI, BK5 CH A1

TOTAL RANGE	0.0	-	0.22				SAMPLE 42
MEAN		0.1396		AVERAGE DEVIATION		0.0515	
STANDARD DEVIATION		0.0672		95 PCT.CONF.INTVL OF MEAN		0.1396 +OR-	0.0284 P;TOTAL



SAMPLE NO. 42

DETERMINATION

NO. LABS
REPORTING

PCT. OF VALUES
REJECTED

PCT. OF UNREJECTED VALUES WITHIN
95 PCT. CI X +OR- STD X +OR- 2STD

KJEL-N	22	9	40	60	100
NO2-N	20	5	68	68	100
NH3-N	21	0	48	76	95
NO3-N	27	7	24	76	96
P, TOTAL	24	0	25	75	92